

DESCRIPTIONS OF NEW SPECIES AND SUBSPECIES OF
ONAGRANDRENA, PRINCIPALLY OF THE ANDRENA
OENOTHERAE COMPLEX

(Hymenoptera: Andrenidae)

E. G. LINSLEY AND J. W. MACSWAIN¹*University of California, Berkeley*

Eight years ago, we commented on the wide distribution and morphological variability among specimens then identified as *Andrena oenotherae* Timberlake (Linsley and MacSwain, 1955). In the meantime we have made an intensive effort to collect representative series from as many localities as possible. With this new material it is now possible to recognize a number of distinctive populations in the complex.

Along the western edge of the Mojave Desert, two such populations overlap in a broad area of sympatry and compete for pollen from the same species of *Oenothera*. These, obviously, may be regarded as distinct species. The remainder, however, appear to be completely allopatric, and, in the absence of genetic data, might equally well be regarded as species or subspecies.

These are described below together with a more distantly related species from Baja California.

ANDRENA (ONAGRANDRENA) OENOTHERAE Timberlake

This is one of the smaller species in the complex. The female varies in length from 9.5-12 mm (mean of 25 individuals 11.12, S.D. $\pm .41$) with the anterior wing from 7.5-8.5 (mean 8.06, S.D. $\pm .09$). The apex of the process of the labrum in the female is parallel-sided, nearly twice as long as broad and the propodeal enclosure is coarsely and irregularly rugose—a distinctive combination of characters. It is distributed from coastal Santa Barbara County, California (Goleta) to northern Baja California (Santo Tomás) extending inland in southern California to the western edge of the Colorado Desert (Palm Springs, Borrego). Females collect pollen from *Oenothera cheiranthifolia suffruticosa*, a perennial of the coastal strand from near Goleta to near Ensenada in northern Baja California, which blooms in the spring and summer, and *Oenothera bistorta*, a spring blooming annual of the coastal bluffs and coastal sage scrub of southern California and northern

¹ The authors express appreciation to the National Science Foundation for support of research on bees associated with Onagraceae through NSF Grant G-7193. We are indebted to Peter H. Raven, Department of Biological Science, Stanford University, for identifying the species of *Oenothera*.

Baja California, which extends inland to the edge of the desert. Our collections of *A. (O.) oenotherae* range from early February to late July, with two peaks, suggesting the possibility that two generations may be involved.

Of the specimens recorded as *oenotherae* by Timberlake (1937), Linsley (1938), and MacSwain (1955), those from the following localities in California are assignable to the species as here restricted: Ventura County: Saticoy; Los Angeles County: Claremont, Glendale, El Segundo Dunes; Orange County: Newport, Balboa Island; San Diego County: Carlsbad, Newton; Riverside, Wineville, Hemet, the Gavilan, Saboba Hot Springs, Palm Springs; and San Bernardino County: 10 miles west of San Bernardino.

Recent collections of this species include the following: 20 ♀ ♀, 1 ♂, Goleta, Santa Barbara County, May 2, 1959, at flowers of *Oenothera cheiranthifolia suffruticosa*, 6:30-7:28 a.m. (P. H. Raven); 24 ♀ ♀, 3 ♂ ♂, Ventura County, April 10, 1959, at flowers of *Oenothera cheiranthifolia suffruticosa*, 7:36-10:59 a.m. (P. H. Raven); 6 ♀ ♀, 2 ♂ ♂, south end of San Buenaventura State Park, Ventura County, June 8, 1959, at flowers of *Oenothera cheiranthifolia suffruticosa*, 6:50-7:20 a.m. (E. G. and Juanita M. Linsley); 13 ♀ ♀, same locality, May 24, 1959, taking nectar from *Chaenactis*, 7:50-8:22 a.m. (E. G. and Juanita M. Linsley); 23 ♀ ♀, 2 ♂ ♂, Point Dume, Los Angeles County, April 18, 1959, at flowers of *Oenothera cheiranthifolia suffruticosa*, 7:35-8:45 a.m. (P. H. Raven); 26 ♀ ♀, same locality and date, at flowers of *Oenothera bistorta*, 6:36-7:27 a.m. (P. H. Raven); 79 ♀ ♀, same locality, April 5, 1959, at flowers of *Oenothera cheiranthifolia suffruticosa*, 6:57-10:17 a.m. (P. H. Raven); 29 ♀ ♀, 16 ♂ ♂, Carlsbad, San Diego County, April 30, 1959, at flowers of *Oenothera cheiranthifolia suffruticosa*, 6:35-8:30 a.m. (P. H. Raven); 208 ♀ ♀, 73 ♂ ♂, same locality, April 21, 1962, at flowers of *Oenothera cheiranthifolia suffruticosa*, 6:30-8:00 a.m. (E. G. and Juanita M. Linsley); 8 ♀ ♀, 2 ♂ ♂, same locality, March 29, 1963, at flowers of *Oenothera cheiranthifolia suffruticosa*, 8:06-8:21 a.m. (E. G. Linsley); one female, one mile north of Oceanside, San Diego County, March 29, 1963, at flowers of *Oenothera cheiranthifolia suffruticosa*, 9:00 a.m. (E. G. Linsley); 1 ♀, 5 ♂ ♂, two miles northeast of Lakeside, San Diego County, March 13, 1963, taking nectar from *Salix* (J. A. Chemsak); 3 ♀ ♀, Claremont, Los Angeles County, April 29, 1959, at flowers of *Oenothera bistorta*, 6:58-8:30 a.m. (P. H. Raven); one female, seven miles east of Temecula, Riverside County, April 23, 1959, at flowers of *Oenothera bistorta*, 6:27 a.m. (P. H. Raven).

Andrena (Onagrandrena) convallaria

Linsley and MacSwain, new species

Female.—Integument black; pubescence black. *Head* with clypeus convex, densely punctate, without indication of a median longitudinal smooth line; labrum with apex of process convex, somewhat arcuate, slightly longer

than wide to nearly one and one-half times as long as broad, sides diverging to apex which is subtruncate with a very faint median notch; antennae with flagellum black, first segment, measured along anterior margin, as long as second and third combined. *Mesosoma* with mesoscutum dullish, finely and closely punctured, punctures mostly less than one diameter apart, interspaces finely reticulate, areas enclosed by reticulations more or less round, not elongate oval; mesoscutellum and mesopleura more closely punctate than mesoscutum, punctures contiguous; propodeum coarsely rugoso-punctate, basal enclosure with a strong median longitudinal carina extending most of the distance from base to apex, apical one-third rugose, lateral carinae numerous, oblique, moderately coarse; wings tinted with blackish; legs with scopa of posterior tibiae one-third wider than tibia, very dense, erect. *Metasoma* moderately slender, shining, second tergum with most anterior hairs long, minutely but distinctly plumose, surface finely punctate, most punctures separated by from two to four diameters, terga two to four with apical impression finely, sparsely punctate, impunctate margin narrow but distinct, shining. Body length approximately 12 mm, anterior wing 8.75 mm.

Male.—Integument black; pubescence of head erect, black, except for a few pale hairs on vertex; dorsal pubescence of thorax long, erect, yellowish-white; pubescence of legs and abdomen black, except for first metasomal tergum. *Head* with apical process of labrum emarginate, bilobed; antennae with flagellum black, first segment slightly longer than second. *Mesosoma* with mesoscutum opaque, very densely punctate, punctures mostly separated by less than half a diameter; mesoscutellum more densely punctate than mesoscutum, punctures subcontiguous; propodeum sculptured much as in female, apex rugose. *Metasoma* with punctures of second tergum mostly separated by two to four diameters, terga with a distinct apical margin. Body length approximately 11 mm, anterior wing 7.75 mm.

Holotype female and allotype male (California Academy of Sciences, Entomology) from 2.5 MILES SOUTH OF LIVINGSTON, MERCED COUNTY, CALIFORNIA, March 20, 1960 (G. I. Stage), and 103 paratypes (California Insect Survey and R. R. Snelling collection) from the same locality as follows: 32 ♀♀, 17 ♂♂, March 20, 1960, at flowers of *Oenothera campestris*, (= *Oe. dentata* var. *campestris*) 7:42-10:14 a.m. (R. R. Snelling and G. I. Stage); 9 ♀♀, 22 ♂♂, March 21, 1960, at flowers of *Oenothera campestris*, 7:38-10:55 a. m. (G. I. Stage); 6 ♀♀, 9 ♂♂, March 24, 1960, at flowers of *Oenothera campestris*, 9:57-1:32 p.m. (R. R. Snelling); 20 ♀♀, 11 ♂♂, April 2, 1960, at flowers of *Oenothera campestris*, 7:29-9:21 a.m. (R. R. Snelling, G. I. Stage); and 4 ♀♀, 3 ♂♂, April 6, 1960, at flowers of *Oenothera campestris*, 7:30-8:15 a.m. (R. R. Snelling). Additional paratypes, from two miles southwest of Livingston, are as follows: 32 ♀♀, 1 ♂, April 4-5, 1959, at flowers of *Oenothera campestris*, 6:55-9:59 a.m. (G. I. Stage);

37 ♀♀, April 17, 1959, at flowers of *Oenothera campestris*, 7:13-9:17 a.m. (J. W. MacSwain and G. I. Stage).

Additional material, not designated as paratype, has been examined as follows: 1 ♂, Antioch, Contra Costa County, California, April 25, 1936 (M. A. Cazier²); 1 ♀, Blackwell's Corner, Kern County, California, April 7, 1950 (P. D. Hurd)²; 3 ♀♀, 20 miles east of Bakersfield, Kern County, California, March 28, 1953 (J. W. MacSwain)²; 96 ♀♀, 41 ♂♂, 18 miles east of Bakersfield, Kern County, California, on various dates in March and April, 1958-1962, at flowers of *Oenothera campestris* (E. G. Linsley, J. W. MacSwain, J. R. Powers, G. I. Stage and R. W. Thorp); 1 ♀, 9.6 miles north of Blackwell's Corner, Kern County, California, March 24, 1961, at *Oenothera campestris*, 8:20 a.m. (J. W. MacSwain); 8 ♀♀, 2.4 miles south of Tipton, Tulare County, California, March 29, 1960, at *Oenothera campestris*, 9:44-10:48 a.m. (E. G. Linsley and J. W. MacSwain); 2 ♀♀, Tulare Airpark, Tulare County, California, April 15, 1960, at *Oenothera campestris*, 7:22 and 7:23 a.m. (E. G. Linsley); 9 ♀♀, 6.8 miles southwest of Shandon, San Luis Obispo County, California, March 23, 1961, at *Oenothera campestris*, 7:55-9:10 a.m. (J. W. MacSwain); 6 ♀♀, same locality, April 2 and 3, 1961, 6:37-7:12 a.m., (E. G. Linsley); 25 ♀♀, 6 ♂♂, Creston, San Luis Obispo County, California, April 10 and 11, 1961, on flowers of *Oenothera campestris*, 7:20-9:50 a.m. (J. A. Chemsak and R. W. Thorp); 3 ♀♀, 2.5 miles south of Creston, San Luis Obispo County, California, April 11, 1961 on flowers of *Oenothera campestris* 7:46-8:37 a.m. (J. W. MacSwain); 2 ♂♂, Chuchupate Ranger Station, base of Frazier Mountain, Ventura County, California, May 8, 1959 (C. W. O'Brien and P. D. Hurd); 23 ♀♀, 14 ♂♂, 1.6 miles west and 2.6 miles east of Pine Canyon Guard Station, Santa Barbara County, California, April 23, 1959 on flowers of *Oenothera campestris*, 6:55-10:30 a.m. (J. W. MacSwain and G. I. Stage); 6 ♀♀, 1 ♂, Hungry Valley, 5 miles south of Gorman, Ventura County, California, April 10, 1960 on *Oenothera campestris*, 6:40-10:20 a.m. (G. I. Stage); and 22 ♀♀, 1 ♂, same locality, May 7, 1959, 5:43-7:14 a.m., (C. W. O'Brien, J. R. Powers and G. I. Stage); 52 ♀♀, 2 ♂♂, 10 miles west of Simmler, San Luis Obispo County, California, May 5-6, 1962 on *Oenothera campestris*, 6:00-8:00 a.m. (J. K. Drew, P. D. Hurd, J. A. Powell, R. W. Thorp and C. A. Toschi).

This species is larger on the average than *A. (O.) oenotherae*, and the females differ in the form of the apex of the process of the labrum, which is less than one and one-half times as long as broad, with the sides diverging toward the apex, which is finely notched. Whereas *A. (O.) oenotherae* is a species of southwestern California from the Colorado Desert edge to the sea coast, taking pollen from *Oenothera cheiranthifolia suffruticosa* and *Oe. bistorta*, *A. (O.) convallaria* is a species of the San Joaquin Valley and western Mojave Desert, taking pollen from *Oenothera campestris*. Near

² Previously reported as *A. oenotherae* (Linsley and MacSwain, 1955)

Bakersfield, California, it occurs sympatrically with *A. (O.) vespertina*, and although the males may be readily distinguished by the color of facial pubescence, the females are difficult to separate, although they are quite different in habits, *vespertina* being active in the late afternoon, rather than the morning, and taking pollen from the white-flowered, evening-opening *Oenothera decorations* rather than the yellow-flowered, morning-opening *Oe. campestris* (a re-examination of the individuals from *Oe. campestris* reported by us as *vespertina*, reveals that they should be assigned to *convallaria*). However, in *A. (O.) vespertina*, the apical process of the labrum is narrow and parallel-sided, rather than broad, somewhat diverging and notched, and the interspaces between the mesoscutal punctures are shining and have elongate-oval rather than round reticulations. The two species appear to be siblings derived from a common ancestral stock with *A. (O.) oenotherae*.

Two subspecies are recognizable in our material, the females of which may be separated as follows:

1. Wings tinted with black; labrum with apex of process usually distinctly longer than broad; mesoscutum with punctures mostly separated by less than one diameter; tibial scopa about one and one-half times as wide as tibia, hairs dense, erect; body length 12-13.5 mm (mean of 25 individuals 12.38, S. D. $\pm .20$ mm), anterior wing 8.25-9 mm (mean 8.76, S. D. ± 0.7 mm) San Joaquin Valley, California *convallaria convallaria*
Wings almost clear; labrum with apex of process as broad or broader than long; mesoscutum with punctures mostly separated by from slightly less than one to slightly more than one diameter; tibial scopa about as wide as tibia, hairs a little less dense and less erect; body length 11.5-13.5 mm (mean of 25 individuals 12.11, S. D. $\pm .33$ mm), anterior wing 8.25-8.75 mm (mean 8.60, S. D. ± 0.2 mm). Southwestern Mojave Desert, California. *convallaria subhyalina*

Andrena (Onograndrena) convallaria subhyalina

Linsley and MacSwain, new subspecies

Female.—Form and coloration of integument and pubescence as in the nominotypical subspecies, but wings not tinted with black. Labrum with apex of process as broad as, or broader than, long. Mesoscutum with most punctures separated by slightly less to slightly more than one puncture diameter. Tibial scopa about as wide as tibia, moderately dense, suberect. Body length 11.5-13.5 mm (mean of 25 individuals 12.11, S.D. $\pm .33$ mm); anterior wing 8.25-8.75 mm (mean 8.60 $\pm .02$).

Male.—Form and coloration of integument similar to nominotypical subspecies, but dorsal pubescence of thorax brownish, rather than yellowish-white. Body length 10.5 mm, anterior wing 7.75 mm.

Holotype female (California Academy of Sciences, Entomology) BORON, KERN COUNTY, CALIFORNIA, April 3, 1959, on *Oenothera campestris*, 7:41 a.m. (J. W. MacSwain), allotype male, same locality and date, taking nectar from *Coreopsis californica*, 8:25 a.m. (J. W. MacSwain), 18 paratypes from the same locality: 2 ♀♀, March 27, 1959, taking nectar from *Coreopsis californica*, 9:59 and 10:15 a.m. (E. G. Linsley and J. W. MacSwain); 2 ♀♀, April 2, 1959, taking nectar from *Oenothera campestris*, 7:02 and 7:55 a.m. (J. W. MacSwain) 4 ♀♀, April 3, 1959, taking nectar from *Oenothera campestris*, 6:48-7:43 a.m. (E. G. Linsley and J. W. MacSwain); 3 ♀♀, same date, taking nectar from *Coreopsis californica*, 8:30-9:00 a.m. (E. G. Linsley and J. W. MacSwain); 4 ♀♀, April 10, 1960, taking nectar from *Oenothera campestris*, 7:02-7:31 a.m. (E. G. and Juanita M. Linsley); 3 ♀♀, same date, taking nectar from *Layia glandulosa*, 8:10-8:25 a.m. (E. G. Linsley). 40 females and four males, from the type locality on various dates in April, 1959 and 1960 (E. G. Linsley, J. M. Linsley, J. W. MacSwain) are stylopized, and hence not designated as paratypes (this represents 67 per cent stylopization of adults, a figure far exceeding any we have found for other species; further, although most of the unstylopized females from *Oenothera campestris* have some grains of pollen on the body, none was actively gathering pollen).

Available material from other areas, not designated as paratypic, is as follows: 6 ♀♀, Little Rock, Los Angeles County, April 25—May 14, 1956, at flowers of *Oenothera campestris* (2 with pollen) (E. G. Linsley, James M. Linsley, J. W. MacSwain³); and 23 ♀♀ (8 stylopized), same data, April, 1959 (E. G. Linsley, J. W. MacSwain).

Andrena (Onagrandrena) oraria

Linsley and MacSwain, new species

Female.—Integument black; pubescence black. Head with clypeus convex, densely punctate, with a feeble elevated median longitudinal smooth line; antennae with first flagellar segment, measured along anterior margin, slightly longer than second and third combined, flagellum black. *Mesosoma* with mesoscutum dullish, very closely punctate, most punctures separated by less than one diameter, interspaces finely reticulate, enclosed areas oval, impressed; mesoscutellum more densely punctate than mesoscutum, punctures contiguous; mesopleura more coarsely, densely punctate than mesoscutum, punctures contiguous; propodeum coarsely rugose-punctate, basal enclosure with a strong, median, longitudinal carina extending two-thirds of distance from base to apex, apical third almost smooth, lateral carinae numerous,

³ Recorded as *A. oenotherae* by Linsley and MacSwain (1956).

oblique, moderately coarse; wings tinted with blackish; legs with scopa of posterior tibiae distinctly wider than tibia, very dense, erect. *Metasoma* moderately slender, shining, second tergum with most anterior hairs long, minutely but distinctly plumose, surface finely punctate, most punctures separated by from two to four diameters, terga two to four with apical impression finely, sparsely punctate, impunctate margin narrow but distinct, shining. Length of body approximately 12 mm, anterior wing 8.5 mm.

Male.—Integument black; pubescence of head erect, black, except for a few pale hairs on vertex; dorsal pubescence of thorax long, erect, yellowish-white; pubescence of legs and abdomen black, except on first metasomal tergum. *Head* with apical process of labrum emarginate, bilobed; antennae with flagellum black, first segment slightly longer than second (6:5). *Mesosoma* with mesoscutum opaque, very densely punctate, punctures mostly separated by less than half a diameter; mesoscutellum more densely punctate than mesoscutum, punctures subcontiguous; propodeum sculptured much as in female, apex not rugose. *Metasoma* with punctures of second tergum mostly separated by two to four diameters, terga with a distinct impunctate apical margin. Body length approximately 10 mm, anterior wing 7.75 mm.

Holotype female (California Academy of Sciences, Entomology) from BEACH ONE MILE NORTHEAST OF POINT REYES LIGHTHOUSE, MARIN COUNTY, CALIFORNIA, April 19, 1959, gathering pollen from *Oenothera cheiranthifolia cheiranthifolia* at 8:59 a.m. (J. W. MacSwain), *allotype male*, same locality and date, flying over nesting area between 9:30 and 11:00 a.m. (J. W. MacSwain), and 31 *paratypes* (California Insect Survey), all from the same locality as follows: two females, at nest site, February 4, 1959 (J. R. Powers and R. W. Thorp); one female and two males, at nest site, April 14, 1959, between 12:45 and 2:00 p.m. (J. W. MacSwain); 8 females and 12 males, at nest site, between 9:52 and 11:00 a.m. and one female gathering pollen from *Oenothera ovata* at 11:17 a.m., April 19, 1959 (J. W. MacSwain); two females (one with pollen) at *Oenothera ovata*, April 21, 1959, 11:29-11:58 a.m. (E. G. Linsley); one female taking pollen from *Oenothera c. cheiranthifolia*, April 21, 1959, at 10:40 a.m., and one male cruising nest area at 11:10 a.m. (J. W. MacSwain); one male, excavated from pupal cell, October 10, 1959 (J. W. MacSwain). Two females, not designated as paratypes, were excavated from fresh burrows at Dillon Beach, February 12, 1939 (E. G. Linsley and J. W. MacSwain). Our flight collections were all made on cold, windy, overcast days (typical of the area during early Spring); presumably on clear warm days the flight is much earlier in the morning.

This species is closely related to *A. (O.) oenotherae* Timberlake, differing in the sculpturing of the basal enclosure of the propodeum, the longer first segment of the antennal flagellum in both sexes and the presence of a weakly indicated elevated median smooth line on the clypeus of the female. Two distinctive populations are recognizable in our material, females of which may be distinguished as follows:

1. Labrum with apex of process narrow, parallel-sided, twice as long as greatest width; clypeus with median longitudinal polished line feeble and incomplete; length 12-13.5 mm (mean of 12 individuals, 12.65 mm, S.D. \pm .15), anterior wing 8.5-9 mm (mean 8.75 mm, S.D. \pm .07). Coastal Marin County, California (Pt. Reyes to Dillon Beach)*oraria oraria*
- Labrum with apex of process broad, wider apically, one and one-half times as long as greatest width; clypeus with median longitudinal polished line more distinct; length 11-13 mm (mean of 25 individuals, 12.12, S.D. \pm .23), anterior wing 8-9 mm (mean 8.65, S.D. \pm .08). Coastal San Francisco County, California*oraria actitis*

Andrena (Onagrandrena) oraria actitis

Linsley and MacSwain, new subspecies

Female.—Form, coloration, sculpturing and pubescence as in the nominotypical subspecies. Labrum with apex of process one and one-half times as long as width at apex, broader apically and not parallel-sided; clypeus with a distinct but weakly developed median longitudinal polished impunctate line. Body length 11-13 mm (mean of 25 individuals, 12.12, S.D. \pm .23), anterior wing 8-9 mm (mean 8.65, S.D. \pm .08).

Male.—Form, coloration, sculpturing and pubescence as in nominotypical subspecies, but average size smaller. Body length of 12 examples, 9.5-11.5 mm (mean 10.33 mm, S.D. \pm .33) as compared with a range of 9.5-11 mm for 17 examples and a mean length of 10.41 mm, S.D. \pm .24, for males of *oraria oraria*.

Holotype female (California Academy of Sciences, Entomology from the SOUTHWEST CORNER, FLEISHHACKER ZOO, SAN FRANCISCO, CALIFORNIA, May 21, 1959, at flowers of *Oenothera cheiranthifolia cheiranthifolia*, 8:58 a.m. (J. W. MacSwain, *allotype* male, same locality, date, and flower association, 9:23 a.m. (J. W. MacSwain), and 49 paratypes, same locality, as follows: May 19, 1959, 16 females (two with pollen) 8:27-10:21 a.m., and 11 males 8:39-10:43 a.m., all at flowers of *Oenothera cheiranthifolia cheiranthifolia*; May 21, 1959, 21 females (9 with pollen) 7:29-9:05 a.m., one male, 9:46 a.m., all at flowers of *Oenothera cheiranthifolia cheiranthifolia*.

Andrena (Onagrandrena) eulobi

Linsley and MacSwain, new species

Female.—Integument black; pubescence black. *Head* with clypeus convex, densely punctate, with a feeble median longitudinal smooth line; labrum with apical process short, one and one-half times as broad as long, parallel-sided, truncate; antennae with flagellum black, first segment, measured along anterior margin, slightly longer than second and third combined. *Mesosoma* with mesoscutum dullish, finely and closely punctured, punctures one or less than one diameter apart, interspaces finely reticulate, areas enclosed by reticulations oval; mesoscutellum and mesopleura more closely punctate than mesoscutum, punctures contiguous; propodeum coarsely rugoso-punctate, basal enclosure with a strong straight median longitudinal carina extending one-half length from base to apex, otherwise enclosure is irregularly rugose; wings almost clear; legs with scopa of posterior tibiae only slightly wider than tibia, dense, erect. *Metasoma* moderately slender, shining, second tergum with most anterior hairs long, minutely but distinctly plumose, surface finely punctate, most punctures separated by from three to six diameters, terga two to four with apical impression finely, sparsely punctate, impunctate margin very narrow but distinct, shining. Body length approximately 12 mm, anterior wing 8 mm.

Holotype female (California Academy of Sciences, Entomology) from 14 MILES SOUTH OF SAN QUINTIN, BAJA CALIFORNIA, MEXICO, March 30, 1962 collecting pollen from *Oenothera crassifolia* at 7:55 a.m. (P. H. Raven), and 37 paratypes from the same locality also collecting pollen from *Oe. crassifolia* between 6:50 and 8:15 a.m.

This species varies considerably in size and a sample of 25 specimens ranges in body length from 10.5 to 13 mm (mean 11.52, S.D. $\pm .44$), in length of anterior wing the range is 8 to 9.25 mm (mean 8.78, S.D. $\pm .09$). The short, broad labral process is the most distinctive feature of *A. culobi* although details of punctation are also diagnostic. It is interesting to note that the type locality is at the northern limit of its host, *Oenothera crassifolia*, and it may be that the bee will be found several hundred miles farther south.

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MEETING NOTICE

The Royal Entomological Society of London will sponsor a Symposium on Insect Reproduction, September 19-20, 1963, at the Imperial College, London.

A NOTE ABOUT LETTERS FROM WILLIAM HENRY EDWARDS TO WILLIAM GREENWOOD WRIGHT, AND CLUES ABOUT CERTAIN DATES OF PUBLICATION CONTAINED THEREIN

F. MARTIN BROWN

Colorado Springs, Colorado

In the archives of the Pacific Coast Entomological Society there is a hoard of well over seven hundred letters and postcards written by William Henry Edwards. These are addressed to William Greenwood Wright. The archives of the Society are housed at the California Academy of Sciences in San Francisco. Through the good offices of Mr. Hugh B. Leech I have had the pleasant opportunity to study this interesting collection of letters. I have arranged them in chronological order and numbered each, in red, in sequence. There is deposited with the letters a synopsis of the entomological comments in each letter. I prepared this to make access to the information a little easier and to protect the original letters from too frequent handling.

The exchange of letters began in 1882 and extended to 1905. Wright instituted the correspondence on 8 January of 1882 and Edwards first letter to Wright is dated 21 January. There are sev-